Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

SIXTH SEMESTER B.TECH. (INSTRUMENTATION & CONTROL ENGG.)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: Embedded System Design [ICE 4002]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Draw diagram wherever required

1A.	Explain different design technologies of embedded system.	**4**
1B.	Define "renaissance engineer" and explain its importance in the present market scenario with an example.	**2**
1C.	What is single-purpose processor? What are the benefits of choosing a single-purpose Processor over a general-purpose processor?	**2**
1D.	List the characteristics of embedded system that distinguish it from other computing systems.	**2**
2A.	Explain, how data memory is partitioned and how data transfer will take place between CPU to cache.	**4**
2B.	Explain the operation of different cache mapping technique with one constraints for each technique	**4**
2C.	Briefly explain scratchpad memory.	**2**
3A.	Illustrate how communication & synchronization is done among process control devices.	**5**
3B.	Explain how page fault occurs and how the fault is serviced. Give over view about TLB.	**5**
4A.	An embedded system is controlling the operation of a lift, which move to respective floor as per request and door will be open for 10 sec. When there is a fire alarm, the lift will be moving to first floor irrespective of request. (a) Draw the FSMD state diagram for this system. (b) Separate the FSMD into an FSM+D.	**5**
4B.	Write a generic PID controller program in C language with comments.	**5**
5A.	Define the following terms with an example: finite-state machines, concurrent processes, real-time systems, and real-time operating system.	**4**

5B. Develop a closed loop control system for a car cruise control. Implement different controller response such as P, PI, PD and PID for the developed loop and draw its responses. **6**

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